

Calculating Infrastructure Costs - Examples

In presented scenarios we are assuming the historical information is not available. The strategy used to estimate infrastructure cost consists of calculating the construction costs and converting to dollars in the year of construction using consumer price indices.

The calculation of infrastructure costs can be complex due to the sophisticated nature of their construction. We recommend that you involve your professional staff when assigning cost variables to infrastructure.

Example 1: Infrastructure asset with unknown construction cost.

A county has 200 lane miles of interstate asphalt road with one concrete bridge 100 feet long and 30 feet wide. The road and bridge were constructed in 1983.

A 1988 cost of \$150,000 per lane mile of interstate asphalt road and base-found in the Roads (Excel file), Urban Streets 3r page one worksheet.

A 1988 cost of \$75,000 per square foot-found in the Bridges (Excel file), Bridge Unit Cost page one worksheet. Total square footage for the bridge is (100ft length)(30ft width) = 3000 ft².

Item	Quantity	1988 Estimated Unit Cost	Estimated Cost
Asphalt road-base & surface cost	200 lane miles	150,000/lane mile	\$30,000,000
Concrete Bridge-(slab)-replacement cost	3000 ft ²	75,000/square foot	225,000,000
Total 1988 estimated cost			\$255,000,000

The 1988 estimated cost needs to be deflated to the construction year, which is 1983.

$$\frac{(\text{estimated cost}) (\text{consumer price index for acquisition year})}{(\text{consumer price index for year cost available})} = \text{estimated cost at time of acquisition or construction.}$$

Therefore the estimated cost at 1983 is calculated as follows:

$$(\text{1988 cost estimate})(\text{1983 CPI})/(\text{1988 CPI}) = \text{1983 cost}$$

$$(\$255,000,000)(99.5)/(118.0) = \$215,021,186$$

The CPI values used were taken from the SAO website CPI Table, referenced below.
(1983 CPI is 99.5 & 1988 CPI is 118.0)

Example 2-Infrastructure asset with known current cost and unknown cost at construction date.

A city has a year 2000 cost estimate of \$25,000 for 500 feet of trails and paths. However, the trail and paths were actually constructed in 1990. Calculate the cost at the construction date.

The 2000 cost estimate needs to be deflated to the 1990 construction year.

The formula is:

$$\frac{(\text{estimated cost}) (\text{consumer price index for acquisition year})}{(\text{consumer price index for year cost available})} = \text{estimated cost at time of acquisition or construction.}$$

Therefore the estimated cost at 1990 is calculated as follows:

$$(\text{2000 estimated cost})(\text{1990 CPI})/(\text{2000 CPI}) = \text{1990 cost}$$

$$(\$25,000)(129.9)/(172.4) = \$18,837$$

The CPI values used were taken from the CPI Table, referenced below.
(1990 CPI is 129.9 & 2000 CPI is 172.4)